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Practitioner's Docket No.: 791\_187

**MAR 23 2005**

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: Kazumasa YASHIRO, Kenji KAWAMURA and  
Kenshin KITOHI

Serial No.: 10/083,323

Group Art Unit: 1746

Date Filed: February 26, 2002

Examiner: Jonathan Crepeau

Confirmation No.: 4109

For: LITHIUM SECONDARY BATTERY

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 CFR '1.132**

Sir:

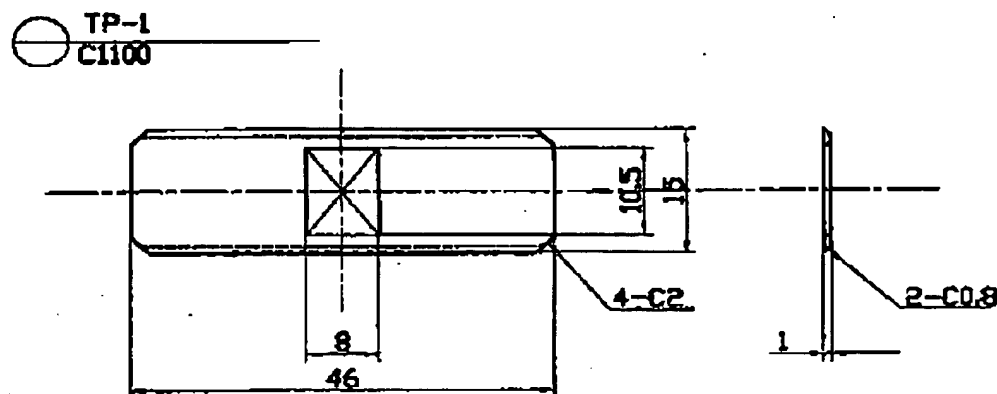
I, KENSHIN KITOHI, a citizen of Japan, hereby declare and state:

1. I have a master's degree in engineering which was conferred upon me by Nagoya University in Nagoya, Japan in 1989.
2. I have been employed by NGK Insulators, Ltd. since 1989, during which time I have been involved for about 10 years in the research and development of batteries, including lithium secondary batteries.
3. I am a co-inventor of the above-referenced patent application, and am familiar with the prosecution history thereof, including the Office Action mailed December 28, 2004 and the prior art references asserted by the Examiner in that Office Action.
4. In the Amendment filed October 13, 2004, we amended claim 1 to clarify that, prior to joining the metallic foils to the collectors, the claimed "predetermined parts" of the collectors are thicker than the remaining parts of the collectors. As explained in the Remarks

of that Amendment, use of collectors of this configuration prior to joining (by laser welding, for example) results in better bonding between the metallic foils and the collector.

5. In the Office Action mailed December 28, 2004, the PTO Examiner acknowledged this argument, but did not give it any weight, stating that there was no evidentiary support that the increased thickness of the predetermined part of the collector "provides a more 'secure' or 'reliable' joint" (12/28/04 Office Action, page 5, lines 9-11).

6. In order to prove that use of the claimed collectors provides a more reliable bond between the collectors and the metallic foils, I directed one of my colleagues to conduct two experiments using a collector of substantially uniform thickness, and a collector having a predetermined part that is thicker than the remaining parts thereof, as claimed. The conventional collector having a substantially uniform thickness is shown below.

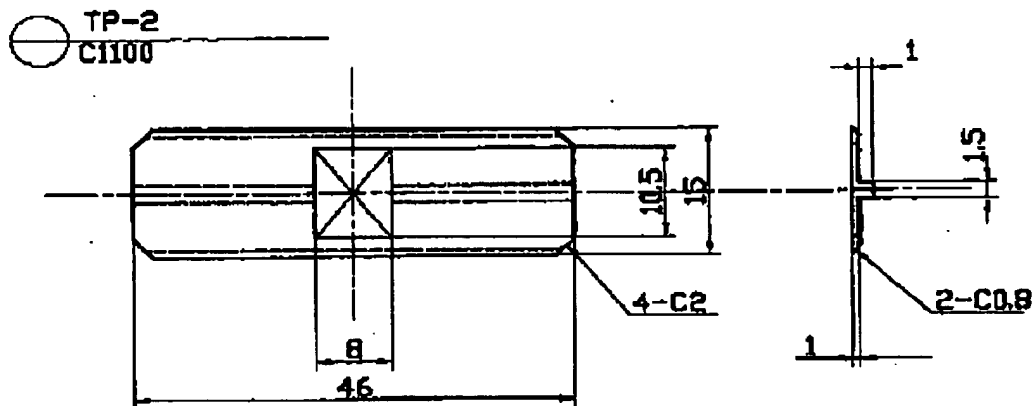


This collector was positioned on the top of a wound metal foil electrode body, and laser welded to the tops of the metal foils along a substantially straight line extending along the length of the collector from one end thereof to the other end thereof, but skipping that portion of the collector surrounding the square hole in the central region thereof.

7. After the welding operation, I visually inspected the welding joint between the bottom surface of the collector and the upper tips of the metal foils. I discovered that many of the metal foils were not bonded to the bottom surface of the collector. I also noticed that the laser actually melted a hole all the way through some portions of the collector and penetrated the metal foils below these portions without creating a weld joint between the collector and the metal foils at these locations. I could easily tear the collector from the top of the metal foils,

which indicates that the strength of the weld joint was quite poor. I also noticed that almost none of the foils remained on the removed collector, which confirms the poor weld joint or lack of a weld joint between the collector and many of the metal foils.

8. I repeated the experiment as described above, but this time I used a collector as shown below.



This collector includes a predetermined part that is thicker than the remaining parts of the collector, as claimed. More specifically, the predetermined part extends along the length of the bottom surface of the collector in the general region where the laser will strike the upper surface of the collector during the welding process.

9. After welding, I inspected the collector and the joint between the bottom surface of the collector and the metal foils. I confirmed that there were no laser holes passing through the collector, and essentially all of the metal foils contacting the bottom surface of the collector seemed to be securely bonded to the collector.

10. I then forcefully removed the collector from the metal foil electrode body. The upper portions of the metal foils were torn away from the main portions of the metal foils and remained bonded to the bottom surface of the collector. This confirms my visual inspection that most of the metal foils were securely bonded to the collector, and also confirms that the strength of the weld joint exceeded the tear strength of the metal foil.

11. These test results prove that, by using a collector having a predetermined part that is thicker than the remaining parts of the collector prior to joining, the resulting bond between the bottom surface of the collector and the metal foils of the electrode body is significantly improved. Accordingly, the process limitation recited in claim 1 in the above-referenced patent application provides a resulting product that is significantly better than the product resulting from the use of a collector having a substantially uniform thickness.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

March 23, 2005  
Date

Kenshin KITO  
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